



## Safety Data Sheet

### 1. PRODUCT IDENTIFICATION

|              |   |
|--------------|---|
| Name         | <b>n-Butyl Alcohol</b>  |
| Synonyms     | normal butanol, butyl alcohol, 1-butanol, butyric alcohol, and others |
| CAS#         | 71-36-3   |
| Europe EC#   | 200-751-6   |
| Product Uses | solvent in coatings, organic chemical synthesis, & others             |

### 2. HAZARDS

**Quick Guide:** flammable liquid, heavy vapour may travel, distant ignition & flashback are possible, irritating to eyes & respiratory system

#### Canada – WHMIS

Key:

#### B 2, D 2B

*B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C*

*D 1 – Immediately Toxic, D 2 – Chronic Toxicity*

*C – Oxidising Substance, E – Corrosive, F – Reactive Substance*

#### U.S.A. – HMIS

Key:

#### Health – 2, Fire – 2, Reactivity – 0

*0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe*

### 3. COMPOSITION

|           | %    | TWAEV / TLV<br>mg/m <sup>3</sup> | LD <sub>50</sub> (mg/kg)<br>ORAL | LD <sub>50</sub> (mg/kg)<br>SKIN | LC <sub>50</sub> ppm<br>INHALATION |
|-----------|------|----------------------------------|----------------------------------|----------------------------------|------------------------------------|
| 1-butanol | 100% | 20 / 61                          | 790                              | 3400                             | 8000                               |

### 4. FIRST AID

|             |   |
|-------------|---|
| SKIN:       | Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.  |
| EYES:       | Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.  |
| INHALATION: | Remove from contaminated area promptly. <b>CAUTION: Rescuer must not endanger himself!</b> If breathing stops, administer artificial respiration and seek medical aid promptly.   |
| INGESTION:  | Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly. |

*Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.*

### 5. FIRE FIGHTING & FLAMMABILITY

|                            |   |
|----------------------------|---|
| Flash Point                | 37°C / 98°F (closed cup)  |
| Autoignition Temperature   | 343°C / 650°F   |
| Flammable Limits           | 1.4% – 11.2%  |
| Combustion Products        | carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments  |
| Fire Fighting Precautions  | alcohol-resistant foam, dry chemical; water fog or spray to cool & dilute, product floats on water – water jet spreads flames; fire fighters must wear SCBA |
| Static Charge Accumulation | cannot accumulate a static charge on agitation or pumping   |

**Please ensure that this MSDS is given to, and explained to people using this product.**

**6. ACCIDENTAL RELEASE MEASURES**

**Summer Fire Risk: Above 30°C, blanket spill with foam as a precaution against accidental ignition and take care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.**

Leak Precaution dyke to control spillage and prevent environmental contamination  
 Handling Spill ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

**7. HANDLING & STORAGE**

Store in a cool, dry environment, away from sources of ignition, heat and substances listed in Part 10. At temperatures above 30°C (86°F) use non-sparking bronze or aluminium hand tools and explosion-proof electrical/mechanical equipment (including lighting, switchgear and forklift trucks).

This product cannot retain a static charge on agitation or transfer between containers. Nevertheless, it is prudent to ground or electrically bond the source container, the receiving container, and transfer pump before transferring contents. Avoid splashing by ensuring that the product nozzle is below the surface in the receiving container.

Empty containers may contain a flammable / explosive vapour. Ensure that containers, whether empty or full, or part full, are tightly sealed unless in use. Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with an organic gas cartridge. *As n-butyl alcohol vapour causes coughing, the need for a respirator will be obvious!*

Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

**8. EXPOSURE CONTROL & PERSONAL PROTECTION**

|                               |  |
|-------------------------------|--|
| Ontario CEV                   | 50ppm / 150mg/m <sup>3</sup>   |
| ACGIH TLV                     | 20ppm / 61mg/m <sup>3</sup>  |
| OSHA PEL                      | 100ppm / 300mg/m <sup>3</sup>  |
| STEL ( <i>lowest listed</i> ) | not listed   |
| Ventilation                   | mechanical ventilation may be required to control airborne titre to regulated limits                               |
| Hands                         | butyl or “Viton” gloves recommended – <i>other types may also protect; consult supplier to confirm suitability</i> |
| Eyes                          | safety glasses with side shields – <i>always protect the eyes</i>  |
| Clothing                      | wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing,                         |

**9. PHYSICAL PROPERTIES**

|   |   |
|---|---|
| Odour & Appearance                            | clear, colourless liquid with sweet, sharp, choking alcohol odour |
| Odour Threshold                               | 1-10ppm – <i>varies widely</i>                                    |
| Vapour Pressure                               | 5.0mmHg / 0.67kPa (20°C / 68°F)                                   |
| Evaporation Rate ( <i>Butyl Acetate = 1</i> ) | 0.5   |
| Vapour Density (air = 1)                      | 2.6   |
| Boiling Range                                 | 118°C / 244°F   |
| Freezing Point                                | -89°C / -129°F  |
| Specific Gravity                              | 0.810 (20/20°C)   |
| Water Solubility                              | 77 grams per litre (20°C / 68°F)                                  |
| Also soluble in                               | most organic solvents   |
| Viscosity                                     | 3centipoise (20°C / 68°F)   |
| pH  | none – ( <i>does not liberate hydrogen ions when dissolved</i> )  |
| Conversion Factor                             | 1ppm = 3.03g/m <sup>3</sup>                                       |
| Molecular Weight                              | 74grams per mole  |

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**10. REACTIVITY**

|                                |   |
|--------------------------------|---|
| Dangerously Reactive With      | strong oxidising agents; sodium or potassium metal; halogens (chlorine etc), isocyanates, acids, acid anhydrides, or acid chlorides, lithium aluminum hydride                 |
| Also Reactive With             | aluminium at above 75°C to form flammable hydrogen gas; acids or acid anhydrides; forms explosive compounds with perchlorates; attacks some plastics (PVC, ABS at high temp.) |
| Stability                      | stable; will not polymerize   |
| Decomposes in Presence of      | not known   |
| Decomposition Products         | none apart from Hazardous Combustion Products   |
| Sensitive to Mechanical Impact | no  |

**11. TOXICITY****Effects, Acute Exposure**

|                  |   |
|------------------|---|
| Skin Contact     | mild to moderate irritant   |
| Skin Absorption  | yes; no toxic effects likely by this route  |
| Eye Contact<br>& | severe irritant; probably will not damage; vapour irritating above 50ppm; eye inflammation<br>blurred vision above 100ppm |
| Inhalation       | irritating @ 25ppm (coughing); pronounced irritation @ 50ppm, which may also cause headache, dizziness, drowsiness        |
| Ingestion        | headache, dizziness, drowsiness, intoxication – <i>unlikely route of industrial exposure</i>                              |

**Effects, Chronic Exposure**

|                               |   |
|-------------------------------|---|
| General                       | prolonged exposure may cause dermatitis; equivocal evidence that prolonged exposure to >80ppm <b>plus</b> noise may cause hearing loss;   |
| Sensitising                   | not a sensitiser in humans or animals – <i>one reported case of sensitisation</i>   |
| Carcinogen/Tumorigen          | not considered a tumorigen or a carcinogen in humans or animals   |
| Reproductive Effect           | no known effect in humans or in animals at doses not also causing maternal toxicity   |
| Mutagen                       | no known effect on humans or animals  |
| Synergistic With              | aromatic hydrocarbons and chlorinated hydrocarbons  |
| LD <sub>50</sub> (oral)       | 790mg/kg (♂rat), 2020mg/kg (♀rat), 2000, 2510, 4360 & 8000mg/kg (rat), 2680mg/kg (mouse), 1200mg/kg (hamster), 3400 & 3485mg/kg (rabbit), |
| LD <sub>50</sub> (skin)       | 3400, 4200 & 5300mg/kg (rabbit)   |
| LC <sub>50</sub> (inhalation) | 7900-8000ppm (rat)  |

**12. ECOLOGICAL INFORMATION**

|                                    |   |
|------------------------------------|---|
| Bioaccumulation                    | not a bioaccumulator; in rats, 83% of butanol dose metabolised within 24 hours  |
| Biodegradation                     | biodegrades readily & rapidly in the presence of oxygen; from 93% in 5 days to 98% in 19 days   |
| Abiotic Degradation                | reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 6-36hours (several reports)   |
| Mobility in soil, water            | water soluble; will move readily in soil and water  |
| <b>Aquatic Toxicity</b>            |   |
| LC <sub>50</sub> (Fish, 96hr)      | 1730-1940mg/litre (Pimephales promelas), 2200-2400mg/litre (Alburnus alburnus), 1200-1700mg/litre (Leuciscus idus)  |
| LC <sub>50</sub> (Crustacea, 24hr) | 2100mg/litre (Nitocra spinipes), 2950mg/litre (Artemia salina)  |
| EC <sub>50</sub> (Crustacea, 48hr) | 1855 & 1983mg/litre (Daphnia magna);  |
| EC <sub>50</sub> (Algae)           | 875mg/litre (Scenedesmus quadricauda), 100mg/litre (Microcystis aeruginosa), 8500mg/litre (Chlorella pyrenoidosa), >500mg/litre (Scenedesmus subspicatus) |
| EC <sub>10</sub> (Bacteria)        | 2250mg/litre (Pseudomonas putida), >990mg/litre (“ <i>activated sludge</i> ”) – <i>note, this is an EC<sub>10</sub></i>                                   |
| EC <sub>50</sub> (Bacteria)        | 2040mg/litre (Photobacterium phosphoreum)   |

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**13. DISPOSAL**

Waste Disposal Containers **do not flush to sewer**, recycle solvent if possible, may be incinerated in approved facility  
**Drums** should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.  
**Pails** must be vented and thoroughly dried prior to crushing and recycling.  
**IBCs** (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years.  
*Never cut, drill, weld or grind on or near this container, even if empty*

**14. TRANSPORT CLASSIFICATION**

|                         |                      |                               |
|-------------------------|----------------------|-------------------------------|
| <b>Canada TDG</b>       | <b>PIN</b>           | <b>UN-1120</b>                |
| <b>AND</b>              | <b>Shipping Name</b> | <b>butanols</b>               |
| <b>U.S.A. 49 CFR</b>    | <b>Class</b>         | <b>3</b>                      |
|                         | <b>Packing Group</b> | <b>III</b>                    |
| <b>Marine Pollutant</b> |                      | <b>not a marine pollutant</b> |
| <b>ERAP Required</b>    |                      | <b>NO</b>                     |

**EMERGENCY INFORMATION**

|               |                               |                       |
|---------------|-------------------------------|-----------------------|
| <b>Canada</b> | <b>Call CANUTEC (collect)</b> | <b>(613) 996-6666</b> |
| <b>U.S.A.</b> | <b>Call CHEMTREC</b>          | <b>(800) 424-9300</b> |

**15. REGULATIONS**

|                      |                     |
|----------------------|---------------------|
| <b>Canada DSL</b>    | <b>on inventory</b> |
| <b>U.S.A. TSCA</b>   | <b>on inventory</b> |
| <b>Europe EINECS</b> | <b>on inventory</b> |

**Immediately Dangerous to Life or Health:** 1400 ppm

**Allowable Tolerances:** Residues of *n*-butanol are exempted from the requirement of a tolerance when used as a solvent or cosolvent in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. *n*-Butanol is exempted from the requirement of a tolerance when used as a solvent for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

**OSHA Standards:** Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 100 ppm (300 mg/cu m). Vacated 1989 OSHA PEL Ceiling limit: 50 ppm (150 mg/cu m), skin designation, is still enforced in some states.

**NIOSH Recommendations:** Recommended Exposure Limit: (15 Min) Ceiling value: 50 ppm (150 mg/cu m) (skin).

**Threshold Limit Values:** 8 hr Time Weighted Avg (TWA): 20 ppm, Excursion Limit Recommendation: Excursions in worker exposure levels may exceed 3 times the TLV-TWA for no more than a total of 30 minutes during a work day, and under no circumstances should they exceed 5 times the TLV-TWA, provided that the TLV-TWA is not exceeded.

**Atmospheric Standards:** This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. *n*-Butyl alcohol is produced, as an intermediate or a final product, by process units covered under this subpart.

**State Drinking Water Guidelines:** Minnesota 700 ug/l, Florida 700 ug/l

**CERCLA Reportable Quantities:** Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802; In the Washington D.C. metropolitan area (202) 426-2675. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

**RCRA Requirements:** As stipulated in 40 CFR 261.33, when *n*-butyl alcohol, as a commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed according to Federal and/or State hazardous waste regulations. Also defined as a hazardous waste is any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill, into water or on dry land, of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (40 CFR 261.5). When *n*-butyl alcohol is a spent solvent, it is classified as a hazardous waste from a nonspecific source, as stated in 40 CFR 261.31, and must be managed according to State and/or Federal hazardous waste regulations.

**FIFRA Requirements:** Residues of *n*-butanol are exempted from the requirement of a tolerance when used as a solvent or cosolvent in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. *n*-Butanol is exempted from the requirement of a tolerance when used as a solvent for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

**FDA Requirements:** *n*-Butyl alcohol (without residue) may be used in inks for marking food supplements in tablet form, gum, and confectionery.

**16. OTHER INFORMATION**

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Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.

Preparation Date: **November 2003** Revision Date: **August 2006, August 2009, August 2012**

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